Space Weather Forecast

Issued on Tuesday, 08 February 2022 at 12:53 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storm activity days 2 and 3 (9th and 10th), associated with anticipated 6th Feb CME passage.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with occasional Common-class X-ray flares observed at GOES 16. These were mainly from AR2939 in the southwest quadrant, however the largest flare was from an ex-region around the northwest limb (ex-2936 or ex-2938).

There are currently four sunspot regions on the visible disc. AR2939, in the southwest quadrant, is a bi-polar group with moderate magnetic complexity. AR2940 and AR2941, respectively located in the northwest and northeast quadrants, are both wide bi-polar groups, but have been mostly inactive. A NEW, unnumbered region has recently developed in the southeast quadrant but it is small and simple.

No Earth directed CMEs have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind has displayed the effects of a waning coronal hole high speed stream, with elevated wind speeds gradually decreasing to slightly elevated levels. The total magnetic field has been weak, with no significant deflections in the important north-south component. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: No solar radiation storms have been observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low in the period, with further occasional Common-class flares, and a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: Waning coronal hole high speed stream effects are expected for day 1 (8th) and the first half of day 2 (9th), with geomagnetic activity expected to be mostly Quiet. The 6th Feb CME is then anticipated to arrive around midday or later on day 2 (9th), bringing an increase in geomagnetic activity and a likelihood of G1/Minor Storm activity. Day 3 (10th) is likely to see further CME influence with Unsettled to G1/Minor Storm activity, although this should begin to reduce later. By day 4 (11th) geomagnetic activity is expected to become Quiet, occasionally Unsettled, as any initial lingering CME effects die away.

Energetic Particles / Solar Radiation: Solar radiation storms carry a daily slight chance of rising close to, or just above, the S1 level given any significant moderate-class X-ray flaring.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	60	40	10
Strong	G3	No	1	10	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	20	20	20
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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